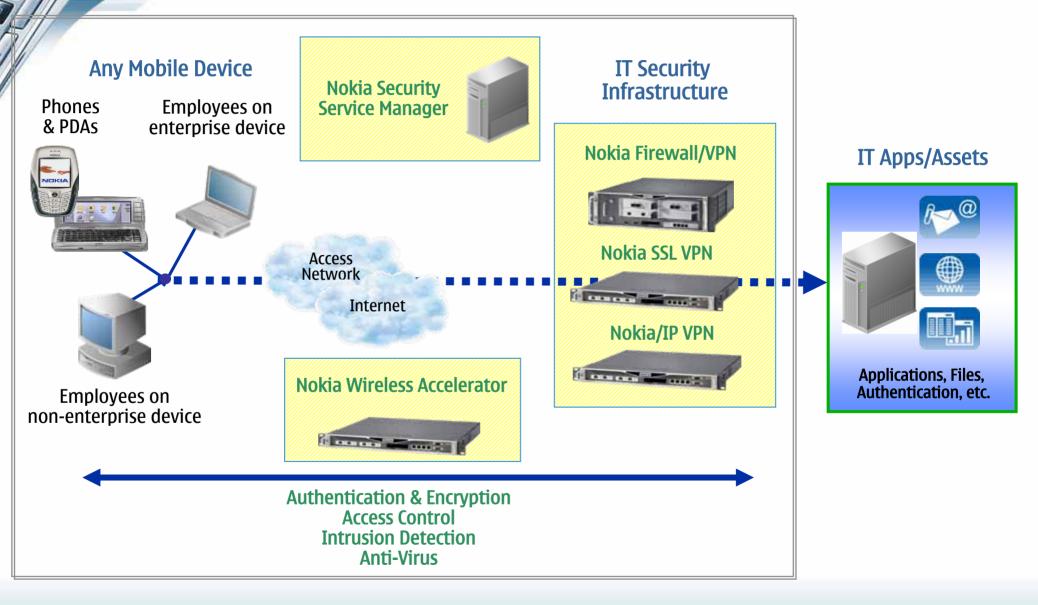


Harri Hämäläinen Nokia Enterprise Solutions

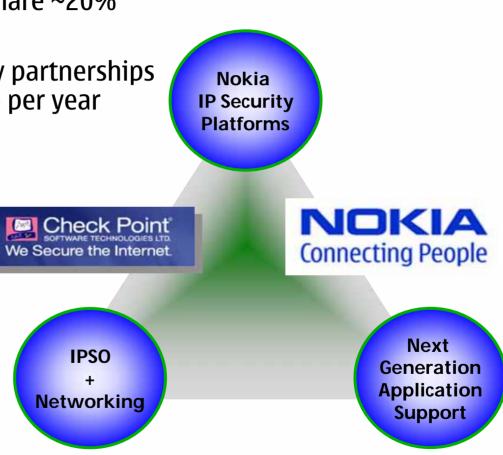


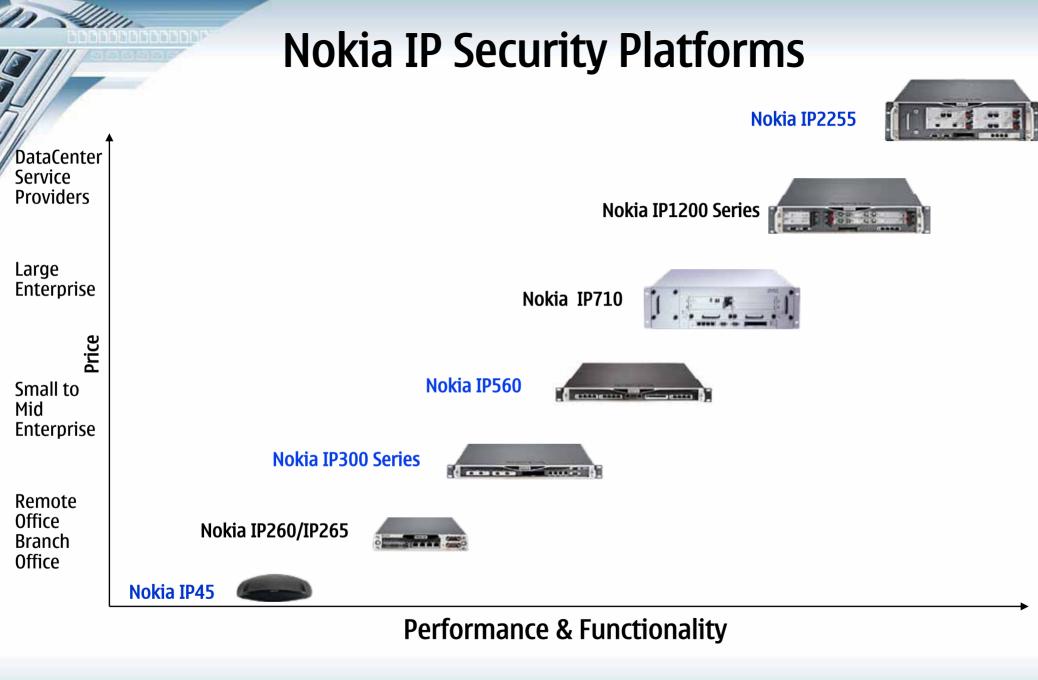
Nokia Secure Mobile Connectivity



Nokia and Check Point

- Nokia and Check Point joint market share ~20%
- In its 8th year
 - one of most successful technology partnerships
 - generating over \$500 mil revenue per year
- Nokia and Check Point support network security for 92 of the Fortune 100









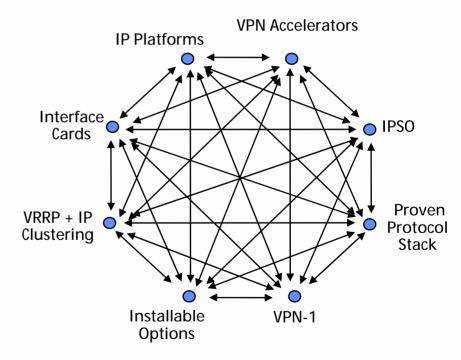
Nokia Quality

Nokia IP Security Platforms are subjected to the most exhaustive quality assurance of any security appliances in the industry

• Nokia tests EVERYTHING:

- 10+ IP platforms with
- ~50 installable options* with
- 5 major versions of IPSO with
- 6 versions of VPN-1 with
- 4 VPN accelerator cards with
- ~10 routing protocols with
- VRRP and IP Clustering
- Investment Protection Nokia QAs new software on EOS hardware
- Quality without compromise -Nokia has held release of VPN-1 on Nokia until QA issues are resolved

TESTED COMBINATIONS

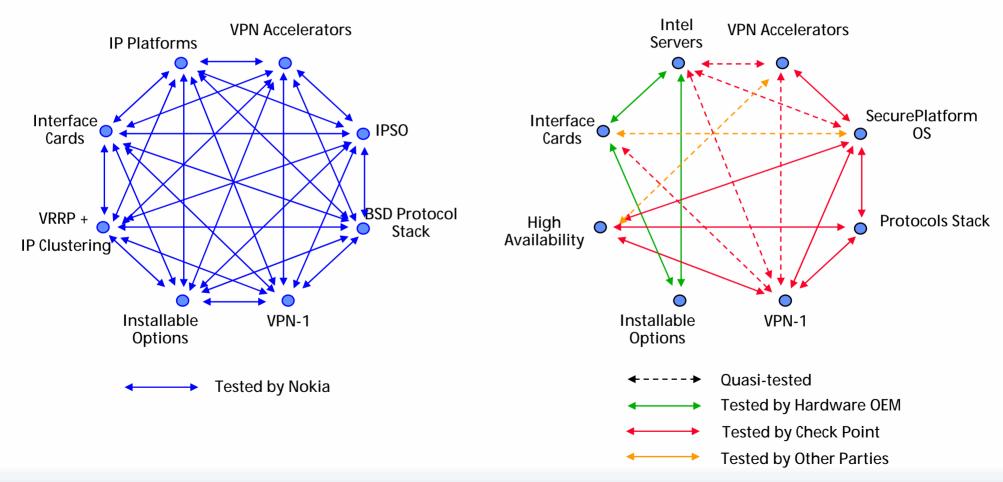


QA Testing Comparison

NOKIA TESTED COMBINATIONS

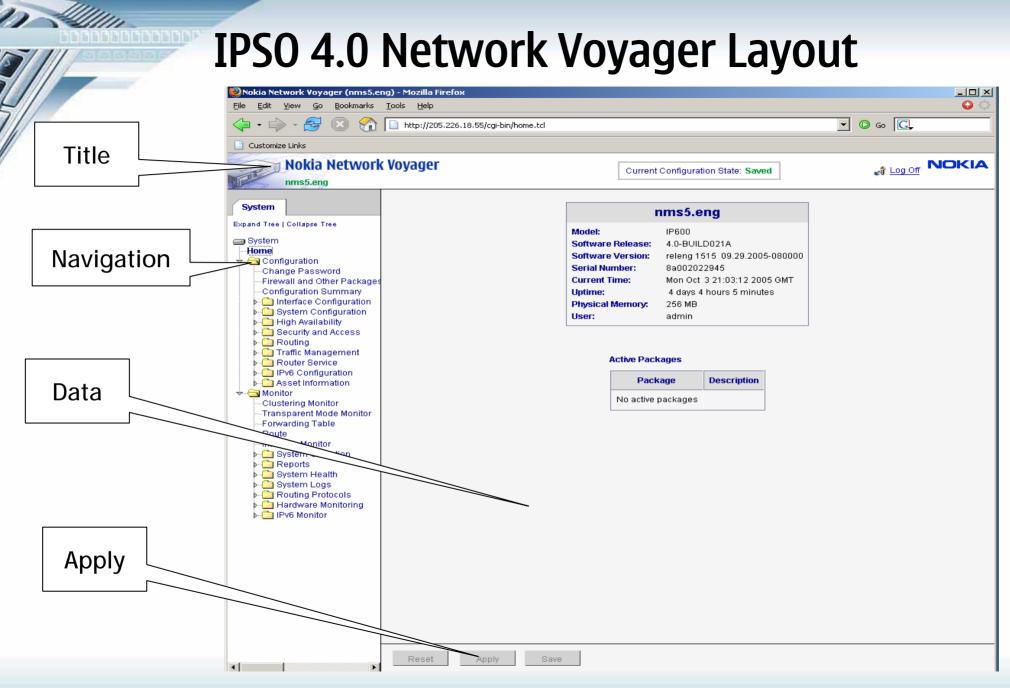
CCCCCCCCCCCCCCCC

SECUREPLATFORM TESTED COMBINATIONS



IPSO 4.0

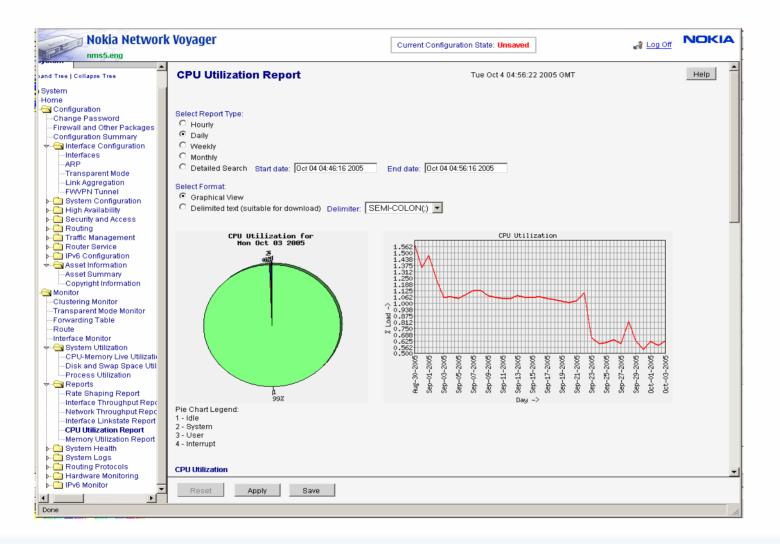
- New Features:
 - New look and feel of Network Voyager
 - Role-based management (Role-Based Access Control)
 - IP Clustering for IP2250
 - BGP 4+ (BGP For IPv6)
 - SNMP v3 USM Improvements
 - Route maps
- New Interface Card: 10GigE
- Support Check Point VPN-1 NGX R60
- Platform Support
 - IP120/130, IP260/265, IP330, IP350/355/380/385, IP530, IP650, IP710/740, IP1220/1260, IP2250
- Upgrade Path: IPSO 3.5, ..., IPSO 3.9



IPSO 4.0 Network Voyager Config Example

Nokia Network	k Voyager			Current Con	figuration State: <mark>Unsa</mark> t	ved		🔏 Log Off N	OKIA
System	Clusterir	ig Con	figuration		Tue Oct 4 04:34	:45 2005 G	мт	H	leip 📩
Expand Tree Collapse Tree	Change cad	imin pase	sword						
Home	Cluster Status	;							
 Configuration Change Password Firewall and Other Packages 	Cluster ID:		10	3 *					
Configuration Summary	Cluster Proto	col State:		(master)					
Interfaces	Time Since J	oin:	0:0	05:34:37					
Transparent Mode Link Aggregation	Number of In	terfaces:	2						
FWVPN Tunnel	Cluster State			Up C Down	_				
→ → → High Availability	Cluster Mode			Multicast O Multicast v	with IGMP C Forward	ing			
Clustering	Work Assign		_	static 💿 dynamic					
Routing Traffic Management	Performance Failure Interv		. ,						
➤ ☐ Router Service > ☐ IPv6 Configuration	Failure interv	ar (immse	conas). jou						
Asset Information	Delete cluster	configura	tion on this system): Delete					
Copyright Information	Interface Con	figuration							
Clustering Monitor Transparent Mode Monitor	Interface	Status	Select	Networks Connected	Cluster IP Address	Primary	Secondary	Hash Selection	_
Forwarding Table	eth-s1p1c0		C Yes € No	205.226.18.0/24		0	0	default 💌	
Interface Monitor	eth-s1p2c0		⊙ Yes C No	10.0.20.0/24	10.0.20.101	œ	0	default 💌	
► 🛄 Reports ► 🛄 System Health	eth-s1p3c0	•	● Yes C No	10.0.30.0/24	10.0.30.101	0	0	default 💌	
► System Logs ► Conting Protocols	FireWall Relat	ed Config	uration						
⊢ Hardware Monitoring⊢ IPv6 Monitor	FireWall Table	•							
	Enable VPN-	1/FW-1 m	onitoring: O E	Enable 🖲 Disable					-
< N	Reset	Apj	oly Save						
Done									

IPSO 4.0 Network Voyager Monitor Example



IPSO 4.0 Network Voyager Cluster configuration

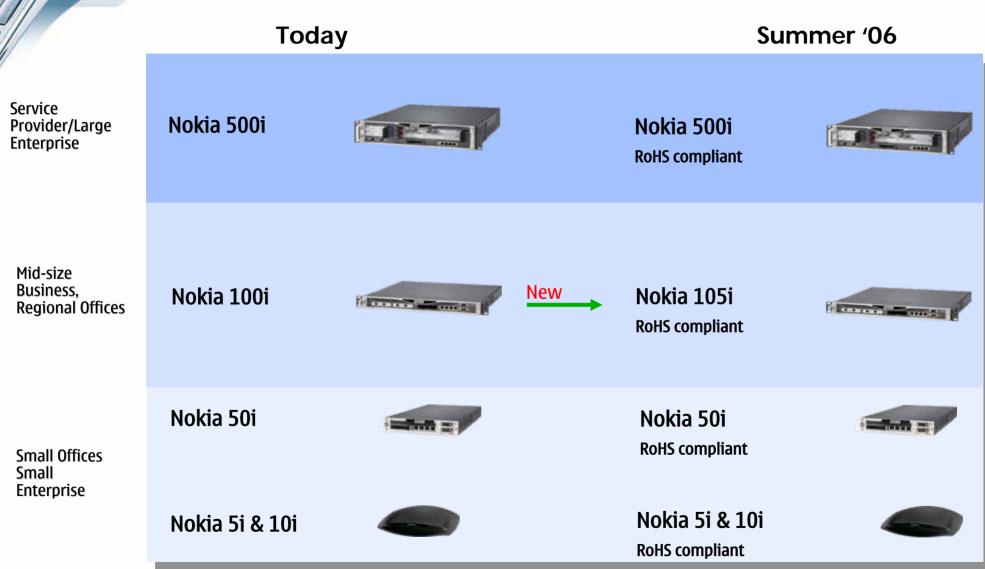
Nokia Cluster V pms5.eng	'oyager			Curr	ent Configu	ration State: <mark>U</mark>	nsaved	di Log Off	NOKIA
Cluster	Clustering C	Config	guration			Tue Oct 4	05:14:16 2005 GMT	г	Help
Expand Tree Collapse Tree 103 Home Configuration System Configuration High Availability Clustering Routing Routing Router Service Asset Information Monitor	Cluster Status Cluster ID: 103 Cluster Mode: Multicast Multicast with IGMP Forwarding Work Assignment: static dynamic Failure Interval (Milliseconds): 500 Cluster Members Cluster Members Clustering Monitor Network Configuration								
	Network	State	Select	Cluster IP Address	Primary	Secondary	Hash Selection		
	10.0.20.0/24	•	⊙ Yes C No	10.0.20.101	œ	0	default 💌		
	10.0.30.0/24	•	⊙ Yes C No	10.0.30.101	o	0	default 💌		
	205.226.18.0/24	۰	O Yes € No		0	0	default 💌		
	FireWall Related C FireWall Table Enable VPN-1/FW Cold Start Interval Reset	-1 monit	oring: O Enak	ele C Disable					
	- Nesei	(iddv	Jave						
Done									

New Products in 2006



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Nokia IP VPN

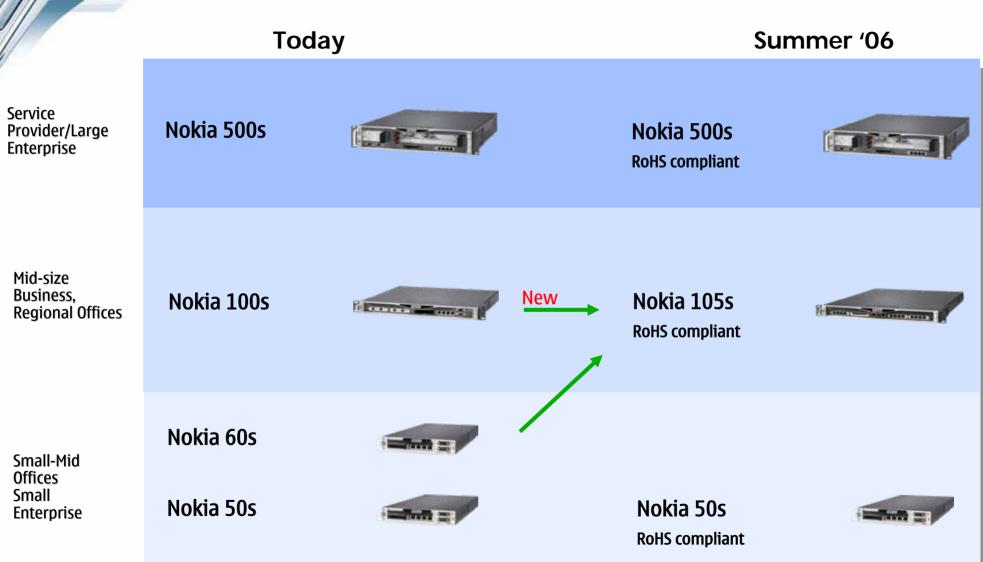


Nokia IP VPN Gateway Performance

Gateway	Nokia 5i	Nokia 10i	Nokia 50i	Nokia 100i	Nokia 500i
Positioning	<i>Mid-size Enterprise (Small offices, home office)</i>	<i>Mid-size Enterprise (Branch Office)</i>	<i>Mid-size Enterprise (Corp Office)</i>	<i>Mid-size Enterprise/ Managed Providers (Remote Access Services)</i>	<i>Mobile/Broadband Operators (Remote Access Services)</i>
VPN Performance (AES-256, SHA-1)**	80 Mbps	90 Mbps	120 Mbps	600 Mbps*	1.5 Gbps
Clustered VPN Performance **	Not Applicable	160 Mbps	190 Mbps	1.0 Gbps*	1.8 Gbps
Simultaneous Tunnels***	25 Tunnels	50 Tunnels	500 Tunnels	10,000 Tunnels	100,000 Tunnels
Ports (10/100) Ports (GigE)	3 0	3 0	4 0	Up to 8 Up to 4	Up to 20 Up to 8
Available Options	Not Applicable	Not Applicable	PC Card Flash	PC Card Flash Quad 10/100 Dual GigE Cu Dual GigE MMF Nokia Encryption Accelerator	PC Card Flash Quad 10/100 Dual GigE Cu Dual GigE MMF
Expansion Slots	0	0	0	2	4
Size	Desktop	Desktop	0.5U	10	20
Base Price (USD)	\$395	\$895	\$2995	\$9995	\$34,995

* With Nokia Encryption Accelerator added ** All performance subject to change ***1 tunnel - 1 IKE Phase 1 SA, 2 IPSec Phase 2 SA

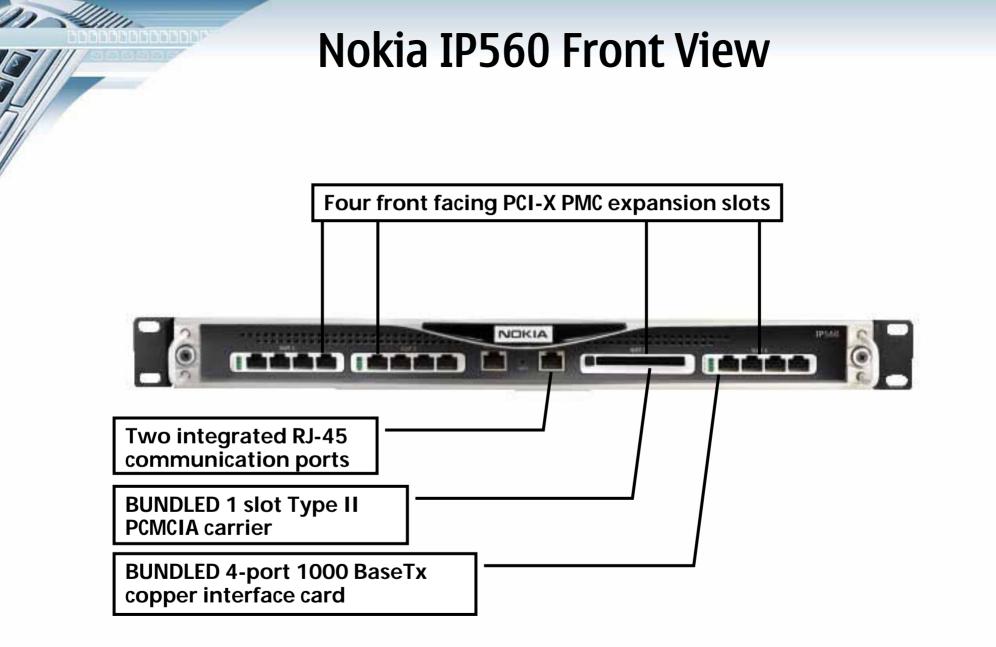
Nokia SSL VPN



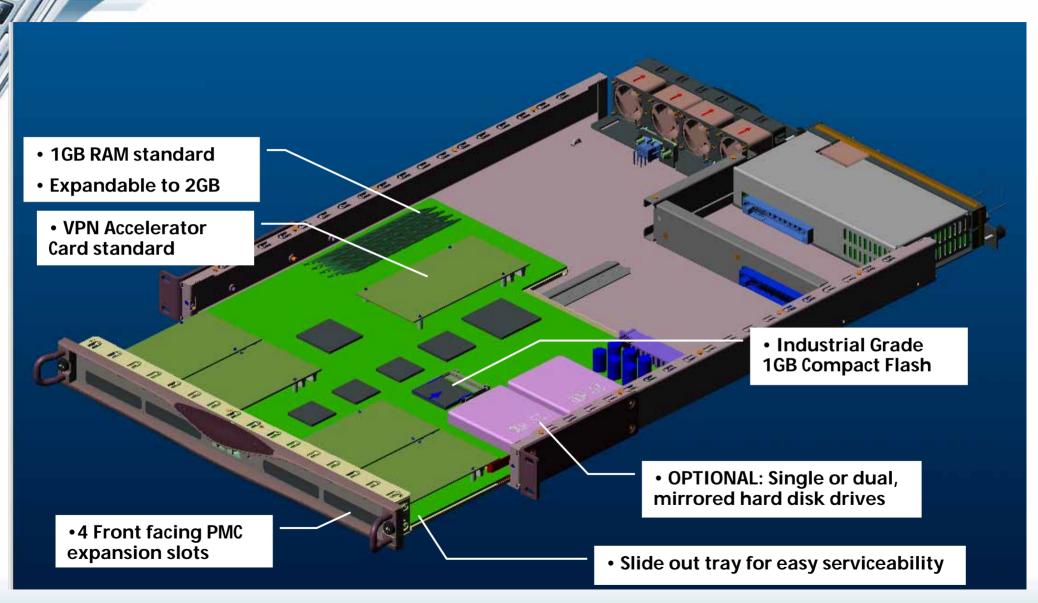
Introducing Nokia IP560







Nokia IP560 Internals



Nokia IP560

- Nokia IPSO with Check Point applications
- RoHS compliant / lead-free manufacturing
- Up to 2GB RAM
- Solid-state slot (Compact Flash)
 - Option for up to two additional hard disk drives for storage and logging
- Four external facing PCI-X PMC card slots
 - One pre-populated with four-port 10/100/1000 Mbps Ethernet
 - Supported network interface cards
 - Four-port 10/100 Mbps Ethernet
 - Four-port 10/100/1000 Mbps Ethernet
 - Two-port 1000 Mbps Fiber Ethernet
 - Two-port 10/100/1000 Mbps Ethernet
 - Bundle One Line Rate Four-port 10/100/1000 Mbps Ethernet Card and single slot PCMCIA card carrier
- Single Internal PCI-X PMC Card Slots Bundled VPN accelerator card
- Two RJ-45 Communication Ports

Nokia IP560

Software requirements

- Nokia IPSO 4.0.1
- Check Point R60 NGX, R55P under Selective Availability program

Performance highlights

- 6.0 Gbps large packet firewall (1518-byte UDP)
- 440 Mbps small packet firewall (64-byte UDP)
- 8,900 HTTP transactions per second
- 58,000 TCP connections per second
- 1,500 Mbps Nokia traffic mix

Keep in mind

- Nokia IP560 does NOT support WAN cards
- Nokia IP560 does NOT support non-RoHS interface cards
- Nokia IP560 interface cards are not hot-swappable
- Check Point management cannot be run on Nokia IP560

Nokia IP560 Compared to Current IP Platforms

	Nokia IP560	Nokia IP380	Nokia IP530	Nokia IP710
FW Performance (1518 byte)	6,000 Mbps	1,400 Mbps	600 Mbps	1,300 Mbps
VPN Performance (1450 byte)	1,900 Mbps	313 Mbps	142 Mbps	380 Mbps
Base ports	4 GigE	4 10/100	4 10/100	4 10/100
Add'l ports	4 10/100	4 GigE	4 GigE	4 GigE
Form factor	1 RU	1 RU	2 RU	3 RU
Purchase price	\$16.495	\$9,995	\$13,495	\$16,495
Add'l NIC cost	\$1,500	\$9,000	\$9,000	\$9,000
Configured cost	\$17,995	\$18,995	\$22,495	\$25,495

Nokia IP560 offers at least 4x the performance, 2x GigE port density, better rack density at less cost

Nokia IP390



- RoHS Compliant
- Up To 2 GB DDR Memory
- Diskless (Compact Flash)
 - Option for one additional hard disk drive for storage and logging
- Four onboard 10/100/1000 Mbps Ethernet ports
- 2 PC Card Slots
- Two External Facing PCI-X PMC Card Slots
 - Network Interface Cards
 - Four-port 10/100 Mbps
 - Two-port 1000 Mbps Fiber
 - Two-port 10/100/1000 Mbps
- Onboard Accelerator and Single Internal PCI-X PMC Card Slots
 - Accelerator Cards
- Two RJ-45 Communication Ports (Console and Auxiliary)

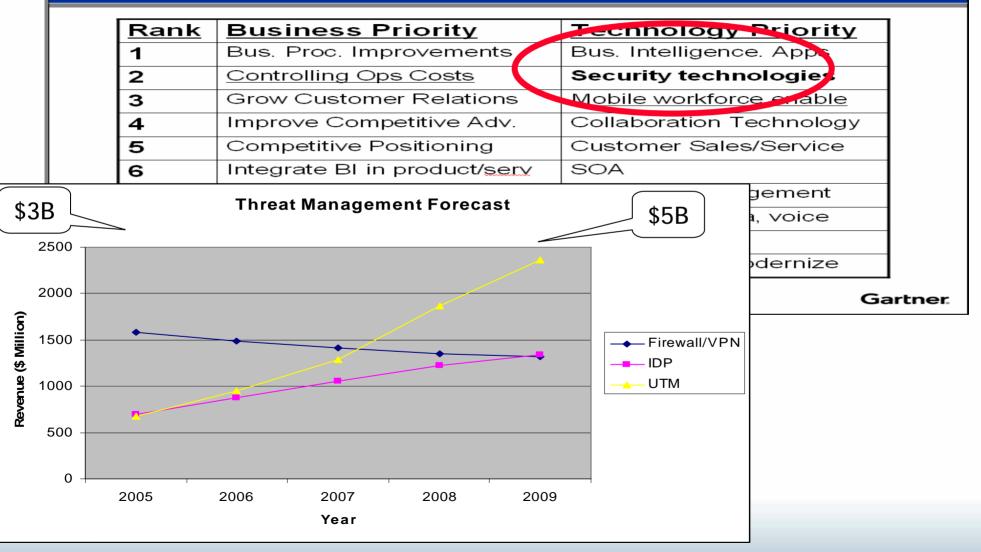
Expected Performance

- Connections per Second: 30,000
- Total Connection Table: 800,000
- Encryption Acceleration for DES, 3DES, AES128, AES256
- Latency less than 200 µs

Industry Trends

Security Continues to Be a Top Priority

 \mathbf{k}



Nokia in Unified Threat Management

Problem:

Multiple discrete services x Multiple Locations = Security Trade-Offs

Nokia UTM:

Unified secure mobility services x Multiple locations = Limited Trade-Offs

Firewall Services Access Control Application Control Protocol Validation Enforcement	ID/P Services Broad Attack Detection Deep Packet Inspection Application Control Real Time Response	Network AV Services Virus Mitigation Spyware, Adware, Malware Detection and Control Malicious Mobile Code Mitigation								
Security Appliances with a "tuned" Operating System (Nokia appliances with IPSO Operating System) <u>Services</u> Resiliency, Performance, Policy Control, flow management, Anomaly Detection, Regulatory Compliance, extensibility										

Nokia Integrated Security with VPN-1 UTM

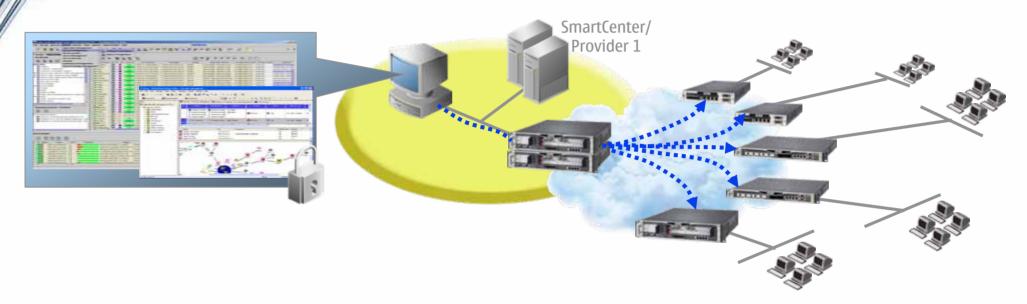
Available first on Nokia IP-390

- RoHS compliant / lead-free manufacturing
- Four integrated 10/100/1000 BASE-T Ethernet interfaces
- Integrated Type II PCMCIA slots
- 1 GB RAM, expandable to 2 GB
- 1GB Solid-state compact flash
 - Optional hard disk drive for storage and logging
- Two external facing PCI-X PMC card slots
- Supported network interface cards
 - Four-port 10/100 BASE-TX Ethernet
 - Two-port 1000 BASE-SX Fiber Ethernet
 - Two-port 10/100/1000 BASE-T Ethernet
- Two RJ-45 Communication Ports

Available Q3, 2006

Pricing to be determined

Management of Nokia IP Security Appliances



- Centralized management for large Nokia IP Security deployments
 - Monitoring and reporting
 - Deployment, maintenance, and recovery
 - Intuitive installation and configuration
- Delivering towards one consolidated management suite
- Reduces administrative tasks

Appliance Manager Key Features

- Highly configurable SNMP-based monitoring for health, faults, & performance
 - Both real-time and historical monitoring (for trending, capacity planning, etc.)
 - Can automatically discover new IP Security Appliances added to the network
 - Receives SNMP traps
- Fault management
 - Filtering, grouping, and event notifications (e.g., via e-mail)
- Reporting
- Centralized web GUI interface
 - Fully secured: can monitor using SNMPv3, GUI secured via SSL
 - Supports role-based administration

Appliance Manager Monitoring, Reporting and Historical Trend Analyses

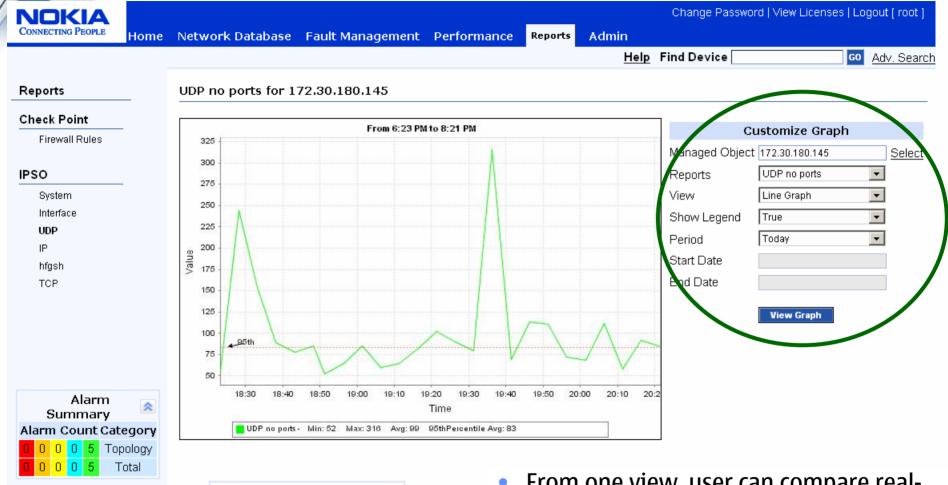
NOKIA CONNECTING PEOPLE	Home	Network	Database Fai	ult Management	Performanc	e Reports		d View Licenses L	ogout (root)	
	\searrow					<u>Help</u>	Find Device	GC	Adv. Search	
Home		Inventor	y Snapshot			Application	n Snapshot			
Home		<i>☞</i> <u>IPSO</u>		<u>24</u> +	<u>2</u> +	🗮 <u>Check</u> P	oint	<u>1</u> †	<u>0</u> +	
About		Recent A	larms			_				
		Status	Failure Object		Date / Time		Alarm Deta	Alarm Details		
		🛐 Major	<u>172.30.165.180</u>		Jan 04,2008 PM	04:47:54	<u>Node failure</u> <u>or</u>	<u>Node failure. This probably means one or</u>		
		😼 Major	<u>172.30.165.0</u>		Jan 04,2006 04:47:54 PM		<u>At least one</u>	At least one node on this net is in failur		
		🛐 Major	<u>172.30.180.171</u>		Jan 04,2006 04:33:01 PM		<u>Node failure</u> <u>or</u>	Node failure. This probably means one or		
		🛐 Major	<u>172.30.180.0</u>		Jan 04,2006 PM	04:33:01	<u>At least one</u>	node on this net is	in failur	
		🛐 Major	<u>172.30.165.153</u>		Jan 04,2006 PM	01:54:44	<u>Node failure</u> <u>or</u>	Node failure. This probably means one or		

Top 6 Devices by Processor Utilization-Today Top 6 Devices by Percentage of Active Real Memory-Today

Name [Units in %]	Min.	Мах.	Avg.	Name [Units in Kbps]	Min.	Мах.	A
<u>172.30.180.173</u>	2829	4256	3708	<u>172.30.165.169</u>	448	448	4.
172.30.165.64	8	74	21	<u>172.30.180.149</u>	276	276	27
172.30.165.170	5	37	19	<u>172.30.180.162</u>	207	207	20
172.30.165.106	4	19	17	<u>172.30.180.146</u>	173	173	17
<u>172.30.165.172</u>	5	31	15	<u>172.30.180.163</u>	172	172	17
172.30.165.174	15	15	15	<u>172.30.180.161</u>	170	170	17

	Alarm Summary										
Ala	arn	n C	ου	Int	Category						
0	8	0	0	16	Topology						
0	8	0	0	16	Total						

Historical and Real-time Monitoring



Date	Time	Value
Jan 4, 2006	6:23 PM	56
Jan 4, 2006	6:28 PM	244
Jan 4, 2006	6:33 PM	154

- From one view, user can compare realtime statistics to historical information
- Report can be easily customized on the fly

Fault and Health Monitoring

NOKIA CONNECTING PEOPLE

Home Network Database Fault Management

Performance Reports Admin

Change Password | View Licenses | Logout [root]

Topology

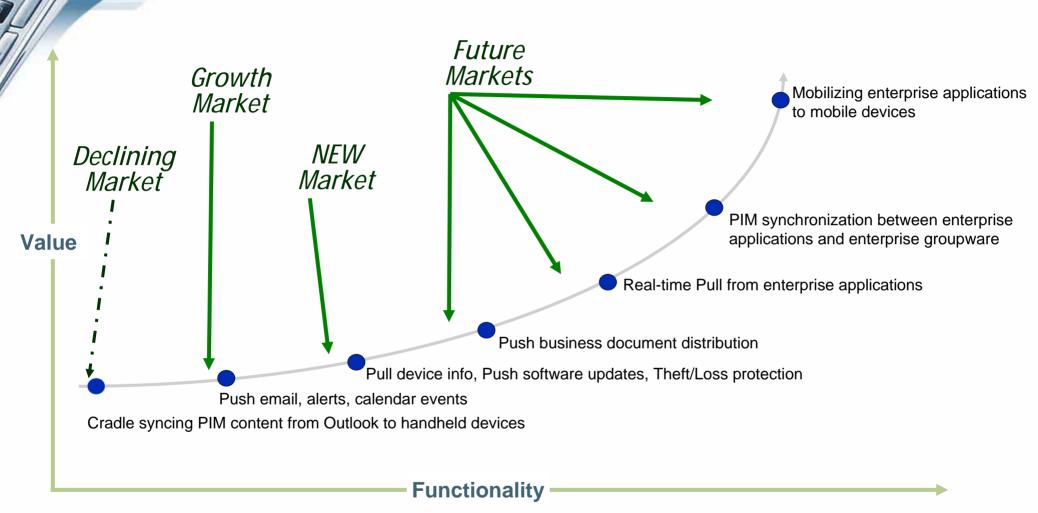
Topology Topology

			V						Help Find Device	GO Adv. Sear
Fault Management	Alarm	s								
Network Events	Add Cł	nild View Edi	it View Criteria Search Pi	rint versi	on Cust	omize Columns				
Alarms	View	Events	ar Delete Pickup Unpi	ck						
						Page Leng	th 25 💽 1 to	0 24 of 24 🔣 🔍 🔍 🕅		
		<u>Status</u>	<u>Failure Object</u>	Act	ions	<u>Alarm Group</u>	<u>Owner</u>	<u>Date / Time</u> ▼	<u>Alarm Details</u>	<u>Category</u>
		1	<u>172.30.180.6</u>	<u> </u>	B	172.30.180.6		Jan 04,2006 05:08:05 PM	Node clear. No failures on this	Topology
		1	IF-172.30.180.6	<u> </u>	F	172.30.180.6		Jan 04,2006 05:08:05 PM	Interface clear.	Topology
		2	<u>172.30.165.180</u>	<u> </u>	P.	172.30.165.180		Jan 04,2006 04:47:54 PM	Node failure. This probably mean	Topology
			<u>172.30.165.0</u>	<u> </u>				Jan 04,2006 04:47:54 PM	At least one node on this net is	Topology
		2	IF-172.30.165.180	<u> </u>	F	172.30.165.180		Jan 04,2006 04:47:54 PM	Interface failure. Status poll f.,	Topology
			<u>172.30.180.171</u>	<u> </u>	F	172.30.180.171		Jan 04,2006 04:33:01 PM	Node failure. This probably mean	Topology
			<u>172.30.180.0</u>	<u> </u>	F			Jan 04,2006 04:33:01 PM	At least one node on this net is	Topology
			IF-172.30.180.171	<u> </u>	E.	172.30.180.171		Jan 04,2006 04:33:00 PM	Interface failure. Status poll f	Topology
		T	<u>172.30.165.64</u>	A		172.30.165.64		Jan 04,2006 03:27:52 PM	Node clear. No failures on this	Topology
Alarm		1	IF-172.30.165.64	<u> </u>	E.	172.30.165.64		Jan 04,2006 03:27:51 PM	Interface clear.	Topology
Summary larm Count Category		1	<u>172.30.180.7</u>	<u> </u>	F	172.30.180.7		Jan 04,2006 03:13:16 PM	Node clear. No failures on this	Topology
8 0 0 16 Topology		1	IF-172.30.180.7	<u> </u>	F	172.30.180.7		Jan 04,2006 03:13:16 PM	Interface clear.	Topology
8 0 0 16 Total		T	<u>172.30.165.173</u>	<u> </u>	F	172.30.165.173		Jan 04,2006 03:12:06 PM	Node clear. No failures on this	Topology
		1	IF-172.30.165.173	<u> </u>	F	172.30.165.173		Jan 04,2006 03:12:06 PM	Interface clear.	Topology
		1	<u>172.30.165.172</u>	<u> </u>	P	172.30.165.172		Jan 04,2006 03:11:55 PM	Node clear. No failures on this	Topology
		1	IF-172.30.165.172	<u> </u>	E.	172.30.165.172		Jan 04,2006 03:11:55 PM	Interface clear.	Topology
		1	<u>172.30.165.170</u>	A	P.	172.30.165.170		Jan 04,2006 03:11:30 PM	Node clear. No failures on this	Topology
		1	IF-172.30.165.170	<u> </u>	P.	172.30.165.170		Jan 04,2006 03:11:30 PM	Interface clear.	Topology
		T	<u>172.30.165.106</u>	A	F.	172.30.165.106		Jan 04,2006 03:11:07 PM	Node clear. No failures on this	Topology
		1	IF-172.30.165.106	A	P.	172.30.165.106		Jan 04,2006 03:11:07 PM	Interface clear.	Topology
			<u>172.30.165.153</u>	<u> </u>	F	172.30.165.153		Jan 04,2006 01:54:44 PM	Node failure. This probably mean	Topology

- Maintains alarm summary on each page
- Consolidated list makes it easy to drill for details and troubleshoot

Nokia Intellisync Acquisition

How the Mobility Market is Evolving

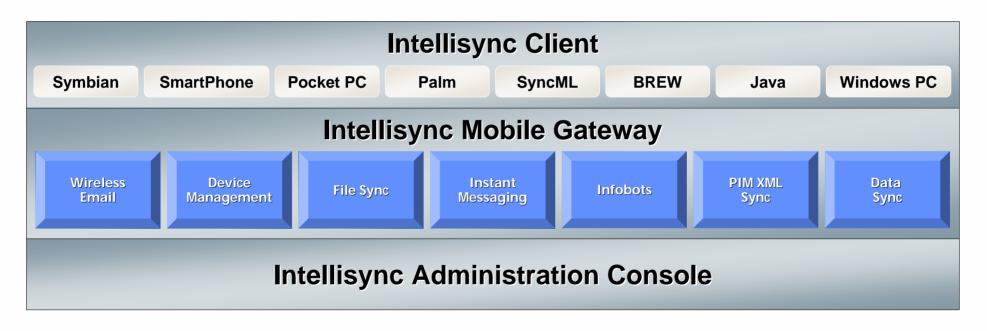


Mobile Suite Platform Overview

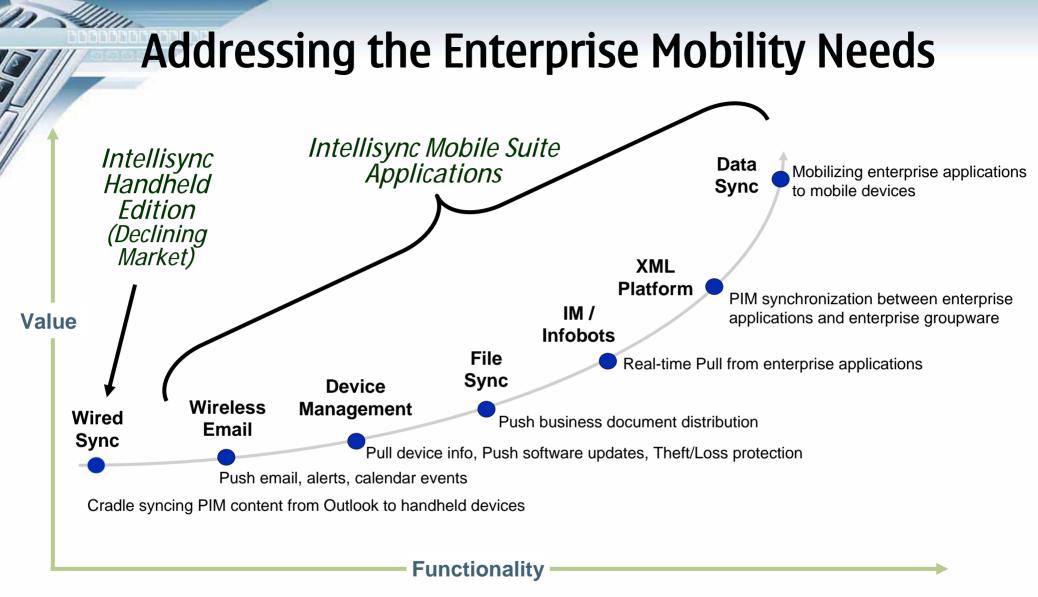
One Client GUI

- + One Communications Gateway
- + One Admin Console across all modules

= One Infrastructure Choice







Mobile Suite Platform

